IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

NEXEON LIMITED, Plaintiff, v. EAGLEPICHER TECHNOLOGIES, LLC and ONED MATERIAL LLC, Defendants.	Civil Action No. 15-955 (RGA)

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Nexeon Limited ("Nexeon"), by its undersigned attorneys, files this complaint for patent infringement against Defendants EaglePicher Technologies, LLC ("EaglePicher") and OneD Material LLC ("OneD Material") (collectively referred to herein as "Defendants") and, in support thereof, alleges as follows:

THE PARTIES

1. Plaintiff Nexeon Limited is a company organized under the law of England and Wales, having a principal place of business at 136 Eastern Avenue, Milton Park, Abingdon, Oxfordshire OX14 4SB, United Kingdom. Nexeon holds all right, title, and interest in each patent in this action.

2. On information and belief, Defendant EaglePicher Technologies, LLC is a Delaware limited liability corporation with its principal place of business at C & Porter Streets, Joplin, MO 64802.

3. On information and belief, Defendant OneD Material LLC is a Delaware limited liability corporation with its principal place of business at 2625 Hanover Street, Palo Alto, CA 94304.

JURISDICTION AND VENUE

4. This is a civil action for patent infringement under the acts of Congress relating to patents, namely the Patent Laws of the United States, 35 U.S.C. §§ 1, *et seq*. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338.

5. This Court has personal jurisdiction over Defendants.

6. EaglePicher is incorporated in Delaware and is therefore subject to the jurisdiction of this Court. As a domestic corporation, EaglePicher is registered to do business with the State of Delaware Division of Corporations. Further, EaglePicher has extensive contacts with the State of Delaware and regularly does business in this district.

7. OneD Material is incorporated in Delaware and is therefore subject to the jurisdiction of this Court. As a domestic corporation, OneD Material is registered to do business with the State of Delaware Division of Corporations. Further, OneD has extensive contacts with the State of Delaware and regularly does business in this district.

8. Defendants, incorporated in the district, have committed and continue to commit acts of patent infringement. Defendants have, at a minimum, directly and/or through intermediaries, including subsidiaries, distributors, sales agents, and others, sold and/or offered for sale infringing products, as alleged in further detail below. Therefore, this Court has specific jurisdiction over Defendants.

9. Defendants reside in this District, and as such, they are subject to personal jurisdiction in this district. Therefore, this District is proper venue pursuant to 28 U.S.C. §§ 1391(b) and 1400(b).

FACTUAL BACKGROUND

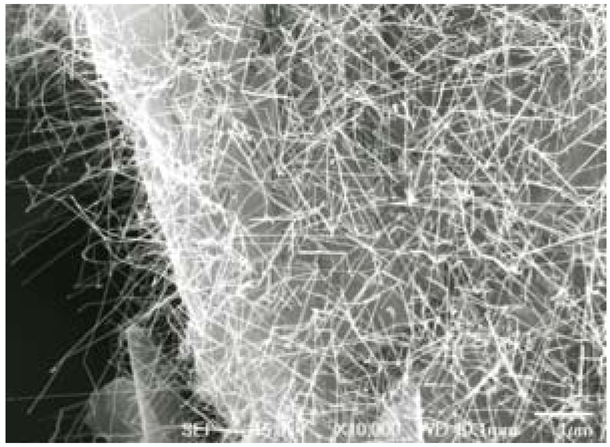
10. Nexeon is a battery materials and licensing company developing silicon anodes for the next generation of lithium-ion battery. Nexeon has developed unique silicon anode technologies that provide improved performance of lithium ion batteries. Ex. A. Nexeon has a pilot plant and is actively soliciting licensees and partners for the implementation of its materials into batteries. Ex. B.

11. Defendant OneD is the manufacturer and marketer of SiNANOde™ branded products, which are silicon-graphite materials that are claimed to be "capable of significantly increasing the energy density and cycle life of a large variety of Lithium-ion batteries." Ex. C.

12. On its website, OneD describes the SINANOde™ material as follows:

> SiNANOde™ is a high-performance silicon-graphite nanomaterial capable of significantly increasing the energy density and cycle life of a large variety of Lithium-ion batteries.
>
> SiNANOde™ consists of silicon nanowires grown on various types of commercially available graphite powder. It can be produced in various grades ranging from 8% to 50% silicon to carbon weight ratio.
>
> The performance of full cells using SiNANOde™ can be optimized to meet the specific requirements of each application.
>
> The SiNANOde™ anodes can be matched with many existing and new cathodes, including NCA (Nickel Cobalt Aluminum Oxide), LCO (Lithium Cobalt Oxide), NCM (Nickel Cobalt Manganese Oxide) cathodes and other materials.
>
> SiNANOde™ is well suited for many market segments ranging from critical Military and Medical applications, to higher volume applications in Consumer Electronics and Electrical Vehicles.
>
> Ex. D at 1-2 (http://www.onedmaterial.com/technology).

13. The website also includes a micrograph of the SINANOde™ material:



Id.

14. The OneD website further describes the process for manufacturing the SINANOde™ material:

> SiNANOde™ production starts with any of the commercially available types of graphite.
>
> A deposition process adds catalyst nanoparticles onto each graphite particle to later initiate nanowire growth directly onto the graphite in the CVD furnace.
>
> The density of catalyst nanoparticles per graphite particle, as well as other furnace parameters determine the final silicon content per gram of graphite.
>
> Thanks to a proprietary reaction chamber design, each CVD furnace, under automated software control of all process parameters, converts 99.99% of the Silane gas into silicon nanowires attached to the graphite particles.
>
> The resulting SiNANOde™ powder can then easily replace the standard graphite to make a slurry applied onto electrode foil using traditional roll-to-roll production equipment.

Ex. D at 3-4 (http://www.onedmaterial.com/manufacture).

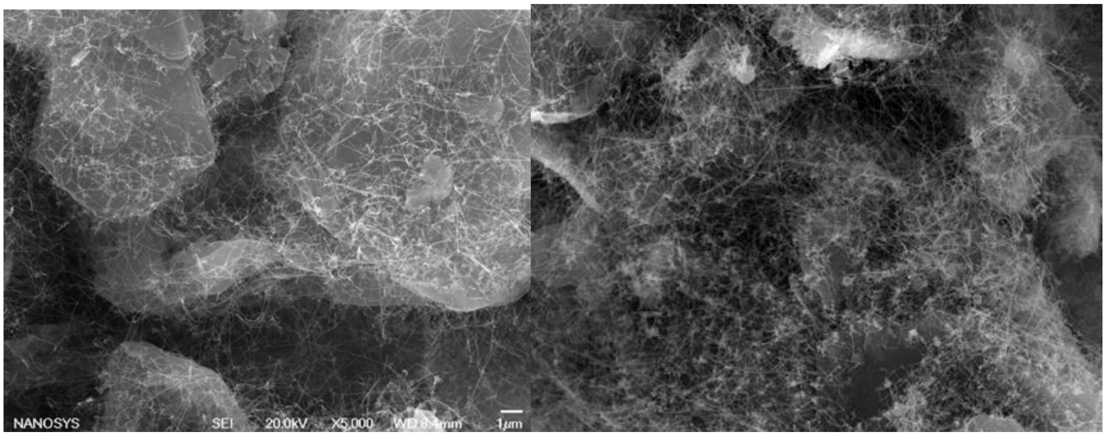
15. On information and belief, the SiNANOde™ materials are manufactured as a powder of graphite particles ("cores") onto which silicon nanowires have been grown using a chemical vapor deposition-vapor-liquid-solid ("CVD-VLS") method. This process is described

in a presentation given by Yimin Zhu at the United States Department of Energy's 2014 Hydrogen and Fuel Cells Program and Vehicle Technologies Office Annual Merit Review and Peer Evaluation Meeting, held June 16-20, 2014. Ex. E at 4 ("Volume production process using graphite as direct substrate for Si nanowire growth"). Dr. Zhu further detailed the characteristics of the SiNANOde ™ materials in presentations at the Lithium Battery Power conference in Washington in November, 2014 (Ex. F) and at the 32nd International Battery Meeting in Florida in March, 2015 (Ex. G).

16. In the VLS method, a coating of metallic nanoparticles (e.g., gold) is deposited onto the graphite particles. A silicon-containing gas is passed over the graphite in a furnace reactor. The nanoparticles act as a catalyst for growth of silicon nanowires therefrom. Each metal catalyst nanoparticle ends up at the tip of a grown nanowire (i.e., not remaining at the base); thus, a silicon-to-graphite interface anchors each nanowire to the graphite particle.

17. On information and belief, in the manufacturing process for a battery having an electrode including the SINANOde™ materials, during the initial charge/discharge cycles of the device, adjacent silicon nanowires can become fused together. If two nanowires are touching or close to each other, when they are lithiated the crystalline silicon structure becomes a Si-Li alloy and expands in volume, connecting the two nanowires. Upon delithiation the silicon is left in an amorphous/disrupted crystalline state and the two surfaces that touched can remain fused together.

18. The June 2014 Zhu presentation describes the SiNANOde™ material as having a "[s]imilar feel to graphite, e.g. tap density similar to graphite powder substrate." Ex. E at 4. The presentation also includes two photomicrographs of the material showing the structure:



19. With respect to use in an anode, Dr. Zhu's presentation suggests various advantages over nanoparticulate silicon and hollow or porous silicon. As compared to nanoparticles and nanopores, "[t]he nanowire has lower surface area/volume ratio, A/V, and hence less side-reaction with electrolyte and better cycle life." Ex. E at 5. *See also* Ex. F at 5; Ex. G at 4.

20. Also according to Dr. Zhu's presentation, the SiNANOde™ material is advantaged over nanoparticulate silicon and hollow or porous silicon in that it exhibits:

> Low A/V & Intact NW after cycling
>
> Pack density similar to graphite
>
> Mass-produced with a competing cost * high Si utilization

Ex. E at 5. *See also* Ex. F at 5; Ex. G at 4.

21. The presentation also describes gold-free materials with silicon content as high as 50%:

> Zero-Au SiNANOde development on different graphite and carbon substrate powders has been extensively explored, which results in a wide range of tunable Si nanowire density on the substrate powders. Smaller powders have higher surface area that can host more Si nanowires. Si nanowire content can be as high as 50% in the SiNANOde composite, corresponding to a specific capacity of >2000 mAh/g.

Ex. E at 8.

22. On information and belief, the SiNANOde™ material manufacturing process can result in a range of silicon weight percentages, including, but not limited to, between 8 and 50 wt% silicon. *See, e.g.,* Ex. E at 9, 12, Ex. F at 9, 12.

23. As shown in the attached Exhibit H from OneD's website, OneD is the owner of U.S. patent application 12/783243, which published as U.S. Patent Application Publication no. 2010/0297502 ("the '502 Publication"; Ex I).

24. On information and belief, the '502 publication describes the SINANOde™ materials and processes for making them. The '502 Publication generally describes embodiments in which silicon nanowires are grown on carbonaceous substrates such as graphite powder particles:

> [0087] In another embodiment, the additives of the present invention suitably comprise one or more nanostructures disposed on a carbon-based substrate (nanostructure—carbon-based substrate compositions). As shown in FIG. 1B, additive **110** suitably comprises nanostructures **114** disposed on carbon-based substrates **112**. In additional embodiments, as shown in FIG. 1E, additive **110′** suitably comprises nanostructures **114** disposed on carbon-based powder **112′**. Suitably, carbon-based powder **112′** comprises particles of about 5 microns to about 50 microns, about 10 microns to 30 microns, about 15 microns to about 25 microns, or about 20 microns. It should be noted that the components shown in FIGS. 1A-1E are not to scale and provided only for illustrative purposes. As described throughout, exemplary nanostructures that can be utilized in the practice of the present invention include nanowires, nanoparticles or nanofilms.
>
> …
>
> [0090] In an embodiment, Si-based nanostructures are grown on carbon-based powder, e.g., graphite powder, without micropores to create a Si-based nanostructure disposed on the graphite powder as shown in FIG. 1E. Suitably, the Si-based nanostructures may comprise Si-based nanowires, Si-based nanofibers, Si particles, Si-based thin layers, and/or Si-based films. In additional embodiments, other materials capable of Li intercalation can be used to grow nanostructures on carbon-comprising powder (e.g., graphite powder).
>
> [0091] Embodiments of the present invention achieve improved conductivity by growing Si-based nanostructures on graphite powder. In addition, the Si-based

> nanostructure disposed on graphite powder can be used in a battery-electrode slurry and battery-electrode layers, which leverages the high capacity of Si and the high conductivity of the graphite powder.

Ex. I at 7.

25. The materials described in the '502 Publication can form porous networks:

> [0099] In exemplary embodiments, the carbon-comprising, Si-based nanowires, nanowire-carbon-based substrate compositions, or scaffold-based nanostructures of the present invention form a porous network in which the nanowires intertwine, interweave or overlap. This arrangement takes the form of a porous structure, wherein the size of pores between the nanowires is suitably mesopores and macropores. As used herein the term "mesopores" refers to pores that are larger than micropores (micropores are defined as less than about 2 nm in diameter), but smaller than macropores (macropores are defined as greater than about 50 nm in diameter), and suitably have a pore size in the range of greater than about 30 nm to less than about 200 nm in diameter. Suitably, the compositions of the present invention will be substantially free of micropores, that is, less than about 0.1% of the pores will be micropores (i.e., less than about 2 nm in diameter). The porous nature these nanowire structures allows for increase mass transport of electrolyte through the structures, resulting in rapid diffusion of the alkali metal ions.

Ex. I at 8.

26. The Examples of the '502 Publication describe the growth of silicon nanowires on carbonaceous powders:

> EXAMPLES
>
> Example 1
>
> Preparation and Characterization of Si Nanowires
>
> Growth and Shape of Si Nanowires
>
> [0147] Vapor-liquid-solid (VLS) methods are utilized for growing Si nanowires. The wires are single crystalline with diameters between about 20 nm and about 200 nm and lengths between about 1 μm and about 50 μm. The growth processes allow for high degrees of freedom in the design of shape, size, composition etc. For example, nanowires are able to be manufactured that are substantially straight and with a yield of greater than about 99% (see FIG. 5A). For battery applications, an interwoven, interleaving or overlapping structure is suitably used (see FIG. 5B). The nanowires can also easily be doped, as well as grown as alloys or multi

phase materials. Suitably, Si nanowires of approximately 20 nm-60 nm diameter in a core/shell configuration where the shell consists of a thin layer of carbon that is mostly covalently bonded to the silicon are produced. This carbon layer provides the path for electronic conductivity.

Suitable Growth Substrates for Silicon Nanowires for Battery Applications: Carbon Black, Graphite, Graphene

[0148] The methods of the present invention can be utilized to prepare silicon nanowires on a variety of different substrate materials and form factors. For use as an additive to battery slurries, nanowires are suitably grown onto carbon black, graphite or on loose graphene nanosheet powder surfaces. In all three cases, it is very straightforward to mix the substrate/Si nanowire compositions/additives into anode materials. As described throughout, growing Si nanowires on graphene or carbon powders allows the structures to accommodate the large volume change during lithiation and delithiation of Si materials. Thus, the Si nanowire materials can be utilized directly in graphite based inks or slurries.

[0149] Carbon black is an effective growth substrate for the nanowires as well as a suitable matrix material for a battery anode, and can easily be integrated into slurry formulations. The nanowires can be grown on carbon black, as well as on other substrates, in densities that can be adjusted in a wide range and thus tailored to the desired performance characteristics. FIG. 6 shows an SEM micrograph of silicon nanowires grown on carbon black. The nanowires form an interwoven and overlapping network that provides a large amount of surface area and accessibility for lithiation and ionic and electron transport.

[0150] The micrographs in FIGS. 7A and 7B show Si nanowires grown on graphite foil, at high (A) and low (B) magnification. FIGS. 24A and 24B show Si nanowires at low magnification (A) and high magnification (B). The average diameter of the nanowires is about 45 nm.

[0151] FIGS. 8A and 8B show SEM micrographs of loose graphene microsheet powders (A) and silicon nanowires grown on the graphene powder (B). The average diameter of the nanowires is 50 nm. Si nanowires grown on the nano or micro graphene nanosheet powders provide high surface area and high mechanical flexibility to the additives. Both graphite foil and graphene powder allow for accommodation of the volume change of the Si nanowires and provide high electronic conductivity.

Ex. I at 12-13.

27. FIGS. 1E, 5A, 5B and 8B of the ‘502 Publication are reproduced below:

FIG. 1D

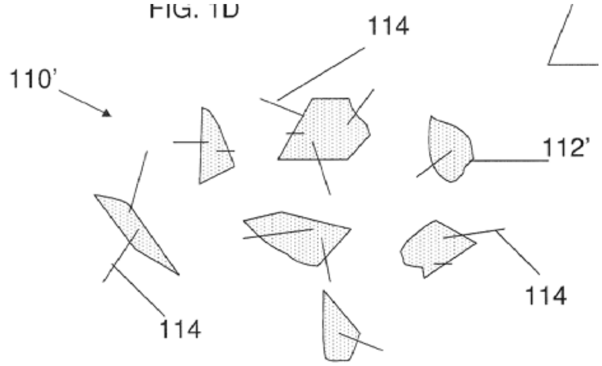


FIG. 1E

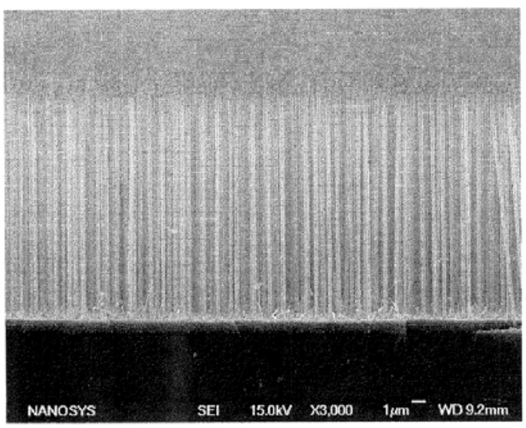


FIG. 5A

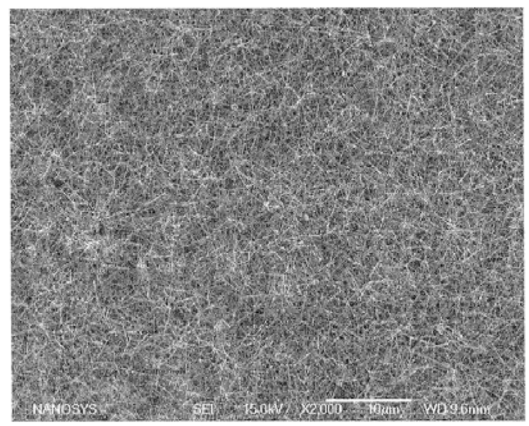


FIG. 5B

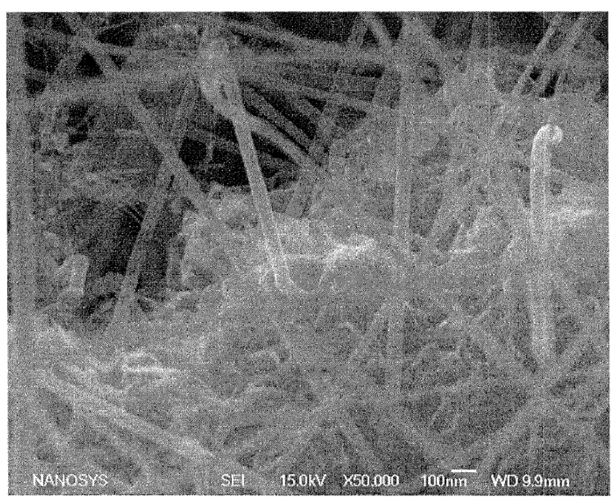


FIG. 8B

Ex. I.

28. On information and belief, OneD has made, offered to sell, and sold quantities of the SiNANOde™ materials to a variety of customers, including prospective licensees of its technology. *See, e.g.,* Ex. F at 3 (describing OneD business model); Ex. G at 8.

29. Defendant EaglePicher is a manufacturer and marketer of a variety of types of batteries, including lithium-ion batteries. Ex. J, Ex. K.

30. EaglePicher has entered into a License Agreement and an Engineering Services Agreement with OneD, to set up a new EaglePicher production facility in Joplin, Missouri to produce the SiNANOde™ material. Ex. L. EaglePicher has broken ground on such new facility, dubbing it the "Lithium Ion Center of Excellence." Ex. K.

31. On information and belief, EaglePicher has and/or is currently actively developing lithium-ion batteries using the SiNANOde™ materials.

32. On information and belief, the EaglePicher batteries include a binder used in forming electrodes from the SiNANOde™ materials. SiNANOde™ is marketed as a drop-in replacement for graphite for making an electrode using well-accepted processes by depositing a slurry on a current collector. This implies the use of binder. *See, e.g.,* Ex. G at 8.

33. By letter dated June 11, 2015, Nexeon notified Defendant EaglePicher that Nexeon had reason to believe that EaglePicher has been and is currently engaged in the development, manufacture, use, offer for sale, and/or marketing of certain materials developed by Defendant OneD under the name SiNANOde™ ("the SiNANOde materials") in the field of lithium battery anodes. Ex. M. Scott Brown, the Chief Executive Officer of Nexeon, followed up this letter with an email to Emily Russell at EaglePicher on July 1. Ex. N

34. Nexeon further advised that EaglePicher's activities, including its activities with respect to the SiNANOde™ material, infringe one or more claims of U.S. Patent Nos. 8,597,831 and 8,940,437. Ex. M.

35. By letter dated October 1, 2015, an attorney representing both EaglePicher and OneD notified Nexeon that his "clients believe that these assertions are baseless and should be withdrawn." Ex. O.

COUNT I
(Infringement of the U.S. Patent No. 8,597,831)

36. Plaintiff Nexeon incorporates paragraphs 1-35 above as if fully set forth herein.

37. Plaintiff Nexeon is the owner of U.S. Patent No. 8,597,831 ("the '831 Patent"), titled "Method of fabricating fibres composed of silicon or a silicon-based material and their use in lithium rechargeable batteries," which was duly and legally issued on December 3, 2013. A true and correct copy of the '831 Patent is attached as Exhibit P.

38. Plaintiff Nexeon has never licensed Defendants under the '831 Patent nor otherwise authorized Defendants to practice the '831 Patent.

39. The claims of the '831 Patent are generally directed to electrodes for electrochemical cells. The '831 Patent describes generally the use of fibrous silicon-based materials in composite anodes:

> In overview the invention allows creation of fibres or hairs of silicon or silicon-based material and the use of these fibres to create both a composite anode structure with a polymer binder, an electronic additive (if required) and a metal foil current collector and a felt-like electrode structure. In particular it is believed that the structure of the silicon elements that make up the composite overcomes the problem of charge/discharge capacity loss.
>
> By laying down the fibres in a composite or felt or a felt-like structure, that is a plurality of elongate or long thin fibres which crossover to provide multiple intersections, for example by being laid down in a random or

> disordered or indeed ordered manner, the problem of charge/discharge capacity loss is reduced.

Ex. P, col. 2, line 63 - col. 3, line 9.

40. The ‘831 Patent describes specifically embodiments in which “in an anode layer such as a composite anode layer, each fibre will contact other fibres many times along their length.” Col. 3, lines 11-13. This configuration provides electrical stability through the lithium insertion/deinsertion cycle:

> [This configuration] [g]ive[s] rise to a configuration where the chance of mechanical isolation arising from broken silicon contacts is negligible. Also, the insertion and removal of lithium into the fibres, although causing volume expansion and volume contraction, does not cause the fibres to be destroyed and hence the intra-fibre electronic conductivity is preserved.

Ex. P, col. 3, lines 13-19.

41. The ‘831 Patent describes a variety of exemplary manners in which the fibres can be fabricated, e.g., dry etching or wet etching of a substrate to form pillars, followed by detachment of the pillars from the substrate. Ex. P, cols. 3-4.

42. Claim 1 of the ‘831 Patent recites:

> 1. An electrode for an electrochemical cell, the electrode comprising an electrically interconnected mass comprising:
>
> elongated structures, wherein the elongated structures are capable of being reversibly charged and discharged and at least some of the elongated structures cross over each other to provide intersections and a porous structure, and wherein the elongated structures comprise silicon;
>
> at least one of a binder and an electronic additive;
>
> wherein the elongated structures and the at least one of the binder and the electronic additive cooperate to define a porous composite electrode layer.

43. Claim 2 of the ‘831 Patent recites:

> 2. An electrode as claimed in claim 1 wherein the elongated structures have a resistivity of 100 to 0.001 Ohm cm.

44. Claim 3 of the ‘831 Patent recites:

> 3. An electrode as claimed in claim 1 wherein at least some of the elongated structures are arranged in a random or disordered manner.

45. Claim 8 of the ‘831 Patent recites:

> 8. An electrode as claimed in claim 1 wherein the intersections comprise a disrupted crystalline or amorphous structure.

46. Claim 10 of the ‘831 Patent recites:

> 10. An electrode as claimed in claim 1 wherein the elongated structures have a resistivity of 100 to 0.001 Ohm cm.

47. Claim 11 of the ‘831 Patent recites:

> 11. An electrode as claimed in claim 1 wherein the elongated structures have an aspect ratio of greater than 40: 1.

48. Claim 13 of the ‘831 Patent recites:

> 13. An electrode as claimed in claim 1 arranged to form a lithium-ion battery with a second electrode and an electrolyte, wherein the electrolyte at least partially fills pores of the porous composite electrode layer.

49. Defendant EaglePicher has directly infringed and continues to directly infringe, either literally or under the doctrine of equivalents, at least claims 1, 2, 3, 8, 10, 11 and 13 of the ‘831 Patent by making, using, selling, and/or offering for sale batteries that include electrodes made of the SiNANOde™ material, covered by claims of the ‘831 Patent without Plaintiff Nexeon’s authorization in violation of 35 U.S.C. § 271.

50. A claim chart detailing infringement of the ‘831 Patent is attached hereto as Exhibit Q.

51. As detailed in Exhibits M-O, Defendants had actual notice of the existence of the ‘831 Patent not later than June 11, 2015. At a minimum, Defendant EaglePicher had actual knowledge of the ‘831 Patent based on a letter sent to Defendant EaglePicher on June 11, 2015, in which Nexeon alleged that Defendant EaglePicher’s activities with respect to the SiNANOde™ materials fall within the scope of the ‘831 Patent. Ex. M. On information and belief, Defendant OneD had actual knowledge of the ‘831 Patent no later than shortly thereafter. *See* Ex. O (demonstrating joint representation of OneD and EaglePicher by the same attorney).

52. Despite having actual notice of the ‘831 Patent, Defendant OneD has and continues to promote, advertise, and instruct customers and potential customers about SiNANOde™ branded products and how to use SiNANOde™ branded products, including infringing uses under 35 U.S.C. § 271 such as incorporating the SiNANOde™ material into an electrode. Defendant OneD’s promotion, advertising, and instruction efforts include, at a minimum, maintenance of the website www.onedmaterial.com. *See* Ex. D. Additionally, Defendant OneD has entered into a License and Engineering Services agreement with EaglePicher; upon information and belief, such Engineering Services include instruction of EaglePicher regarding how to make and use the SiNANOde™ materials. *See* Ex. L. Defendant OneD engaged in these acts with the actual intent to cause the acts which it knew or should have known would induce actual infringement. Thus, Defendant OneD has induced infringement of at least claims 1, 2, 3, 8, 10, 11 and 13 of the ‘831 Patent.

53. The SiNANOde™ material is intended to be incorporated into an electrode. *See, e.g.,* Exs. E-G, I. Because the SiNANOde™ material exhibits the characteristics present in the claims of the ‘831 patent, incorporation of the SiNANOde™ material into an electrode by definition results in an infringement of the ‘831 patent claims, and there can be no non-infringing

electrodes made using the SiNANOde™ material. Given Defendants knowledge of the ‘831 patent, Defendants knew or should have known that the SiNANOde™ material is especially made or especially adapted for use in an infringement of the ‘831 Patent and that there is no substantially non-infringing use of the SiNANOde™ material. Thus, Defendants have contributed to infringement of at least claims 1, 2, 3, 8, 10, 11 and 13 of the ‘831 Patent.

54. Defendants’ products are not staple articles or commodities of commerce suitable for substantial non-infringing use.

55. Defendants’ activities have and continue to constitute active inducement of and contributory infringement of the ‘831 Patent in violation of 35 U.S.C. § 271(b) and (c).

56. Defendants’ infringement of the ‘831 Patent has caused irreparable harm to Plaintiff Nexeon and will continue to do so unless enjoined.

COUNT II
(Infringement of the U.S. Patent No. 8,940,437)

57. Plaintiff Nexeon incorporates paragraphs 1-56 above as if fully set forth herein.

58. Plaintiff Nexeon is the owner of U.S. Patent No. 8,940,437 (“the ‘437 Patent”), titled “Method of fabricating structured particles composed of silicon or a silicon-based material and their use in rechargeable batteries,” which was duly and legally issued on January 27, 2015. A true and correct copy of the ‘437 Patent is attached as Exhibit R.

59. Plaintiff Nexeon has never licensed Defendants under the ‘437 Patent nor otherwise authorized Defendants to practice the ‘437 Patent.

60. The claims of the ‘437 Patent are generally directed to compositions of discrete silicon particles. The ‘437 Patent describes generally particles having silicon-containing pillars extending from a particle core, and their use as active materials in battery electrodes. Col. 3, lines 35-37, 63-67.

> In overview the invention allows creation of pillared particles of silicon or silicon-comprising material and the use of these particles to create both a composite anode structure with a polymer binder, an conductive additive (if required) and a metal foil current collector and an electrode structure. In particular it is believed that the structure of the particles that make up the composite overcomes the problem of charge/discharge capacity loss. By providing a particle with a plurality of elongate or long thin pillars the problem of charge/discharge capacity loss is reduced.

Ex. R, col. 4, line 62 - col. 5, line 4.

61. The specification of the ‘437 Patent describes a variety of methods for making such particles, for example, etching of silicon materials. Ex. R, cols. 5, 6. The pillared particles themselves can be used as the active material in a composite anode.

62. Claim 18 of the ‘437 Patent reads:

> 18. A plurality of discrete particles wherein each particle comprises silicon and includes a particle core and a plurality of silicon-comprising pillars fabricated on the particle core and extending outwardly therefrom from a first end to a second end, wherein each pillar in the plurality of pillars is attached to the core at the first end of the pillar, and the second end of each pillar is an unattached free end, wherein in each particle, the fraction of the surface area of the particle core occupied by the pillars is in the range of 0.10 to 0.50.

63. Claim 19 of the ‘437 Patent reads:

> 19. A plurality of discrete particles as claimed in claim 18 wherein the particles have a first dimension in the range of 10 μm to 1 mm.

64. Claim 20 of the ‘437 Patent reads:

> 20. A composite electrode for a lithium-ion battery comprising a plurality of discrete particles as claimed in claim 18 and further comprising at least one of a conductive additive and a binder.

65. Claim 21 of the ‘437 Patent reads:

> 21. A plurality of discrete particles wherein each particle comprises silicon and includes a particle core and a plurality of silicon-comprising pillars extending outwardly therefrom from a first end to a second end, wherein each pillar in the plurality of pillars is attached to the core at the first end of the pillar, and the second end of each pillar is an unattached free end, wherein in each particle, the fraction of the surface area of the particle core occupied by the pillars is in the range of 0.10 to 0.50.

66. Claim 22 of the ‘437 Patent reads:

> 22. A plurality of discrete particles as claimed in claim 21wherein the pillars are integral with the core.

67. Claim 23 of the ‘437 Patent reads:

> 23. A composite electrode for a lithium-ion battery comprising a plurality of discrete particles as claimed in claim 21 and further comprising at least one of a conductive additive and binder.

68. Defendant OneD has directly infringed and continues to directly infringe, either literally or under the doctrine of equivalents, at least claims 18, 19, 20, 21, and 22 of the ‘437 Patent by making, using, selling, and/or offering for sale products, including at a minimum the SiNANOde™ material, covered by claims of the ‘437 Patent without Plaintiff Nexeon’s authorization in violation of 35 U.S.C. § 271.

69. Defendant EaglePicher has directly infringed and continues to directly infringe, either literally or under the doctrine of equivalents, at least claim 23 of the ‘437 Patent by making, using, selling, and/or offering for sale products, including at a minimum batteries having electrodes made of the SiNANOde™ material, covered by claims of the ‘437 Patent without Plaintiff Nexeon’s authorization in violation of 35 U.S.C. § 271.

70. A claim chart detailing infringement of the ‘437 Patent is attached hereto as Exhibit S.

71. As detailed in Exhibits M-O, Defendants had actual and constructive notice of the existence of the ‘437 Patent. At a minimum, regardless of the foregoing, Defendant EaglePicher had actual knowledge of the ‘437 Patent based on a letter sent to Defendant EaglePicher on June 11, 2015, in which Plaintiff Nexeon alleged that Defendant EaglePicher’s activities with respect to the SiNANOde™ materials fall within the scope of the ‘437 Patent. Ex. M. On information and belief, Defendant OneD had actual knowledge of the ‘437 Patent no later than shortly

thereafter. *See* Ex. O (demonstrating joint representation of OneD and EaglePicher by the same attorney).

72. Despite having knowledge of the '437 Patent, Defendant OneD has and continues to promote, advertise, and instruct customers and potential customers about SiNANOde™ branded products and how to use SiNANOde™ branded product, including infringing uses under 35 U.S.C. § 271 such as incorporating SiNANOde™ materials into an electrode. Defendant OneD's promotion, advertising, and instruction efforts include, at a minimum, maintenance of the website www.onedmaterial.com. *See* Ex. D. And Defendant OneD has entered into a License and Engineering Services agreement with EaglePicher; upon information and belief, such Engineering Services include instruction of EaglePicher regarding how to make and use the SiNANOde™ materials. See Ex. L. Defendant OneD engaged in these acts with the actual intent to cause the acts which it knew or should have known would induce actual infringement. Thus, Defendant OneD has induced infringement of at least claim 23 of the '437 patent.

73. The SiNANOde™ material is intended to be incorporated into an electrode. *See, e.g.,* Exs. E-G, I. Because the SiNANOde™ material exhibits the characteristics present in the claims of the '437 patent, incorporation of the SiNANOde™ material into an electrode by definition results in an infringement of the '437 patent claims, and there can be no non-infringing electrodes made using the SiNANOde™ material. Given Defendants knowledge of the '437 patent, Defendants knew or should have known that the SiNANOde™ material is especially made or especially adapted for use in an infringement of the '437 Patent and that there is no substantially non-infringing use of the SiNANOde™ material. Thus, Defendants have contributed to infringement of at least claim 23 of the '437 Patent.

74. Defendants' products are not staple articles or commodities of commerce suitable for substantial non-infringing use.

75. Defendants' activities have and continue to constitute active inducement of and contributory infringement of the '437 Patent in violation of 35 U.S.C. §§ 271(b) and (c).

76. Defendants' infringement of the '437 Patent has caused irreparable harm to Plaintiff Nexeon and will continue to do so unless enjoined.

RELIEF REQUESTED

THEREFORE, Plaintiff Nexeon prays for judgment and relief including:

(A) Judgment and decree that Defendants have been and are infringing one or more of the claims of the '831 and '437 Patents pursuant to 35 U.S.C. §§ 271(a), (b), and (c);

(B) A preliminary and permanent injunction enjoining Defendants and their respective officers, directors, agents, servants, affiliates, employees, divisions, branches, subsidiaries, parents, and all others acting in concert or privity with any of them from infringing, inducing infringement of, or contributing to infringement of the '831 and '437 Patents;

(C) An award of damages incurred by Plaintiff Nexeon as a result of Defendants' infringement of the '831 and '437 Patents as provided under 35 U.S.C. § 284;

(D) An assessment of costs, including reasonable attorney fees pursuant to 35 U.S.C. § 285, and prejudgment interest against Defendants; and

(E) Such other and further relief as this Court may deem just and proper.

Dated: May 5, 2016

/s/ Mary B. Matterer
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